

Nerve Agents

What are nerve agents?

Nerve agents are chemicals that interfere with the nervous system. Sarin, soman, tabun and VX are examples of nerve agents that all have similar effects. Experts are concerned that terrorist groups may be able to make nerve agents. For example, a religious cult in Japan used sarin in a 1995 Tokyo subway attack that killed 12 and injured as many as 5,000 people. Nerve agents have no industrial uses and are not easily obtainable, but a skilled chemist may be able to make them.

How can people be exposed to nerve agents?

Sarin, soman and tabun are about the consistency of water and can form vapor that floats in the air. These agents generally enter the body through breathing the vapor. VX is different because it has the consistency of motor oil and does not easily form a vapor. VX harms people when the liquid enters the body through the skin. If a nerve agent were used in an attack, people coming into contact with either the liquid or the vapor could be harmed. Terrorists could release nerve agents into a crowded area. Nerve agents are more harmful if released in enclosed areas compared to outdoors.

How can people recognize that they are sick from nerve agents?

If you see several people suddenly become ill, you should suspect a nerve agent release. Symptoms of exposure to nerve agent vapor may include: eye burning, tearing, pain and dim vision; runny nose, cough and difficulty breathing; headache, lightheadedness, confusion and weakness; sweating; stomach aches and diarrhea; and, muscle twitching. Symptoms can quickly progress to sudden collapse, convulsions, and even death.

How soon after exposure do the symptoms appear?

People who are exposed to nerve agent vapor may experience immediate eye pain and tearing, dim vision, runny nose and cough. Within minutes people may become seriously ill. Symptoms of VX exposure may take hours to develop.

How can people avoid exposure to nerve agents?

If a nerve agent is released in an area, people should calmly and quickly leave the area. It is dangerous to return to an area with nerve agent contamination until it has been cleaned up and checked by experts.

What should people do if they have been exposed to nerve agents?

It is important to act quickly if exposed.

- If vapor is breathed, immediately move to fresh air. People exposed to vapor should take off their outer clothing (such as jackets, coats or shirts) right away.
- If liquid chemical soaks clothing or skin, then take the clothes off right away and wash skin with large amounts of water to flush away the chemical. Soap and water wash is best, but if you cannot find soap, just use water.

People feeling sick should get medical care immediately. Often the local emergency department is the best place for a medical evaluation after exposure to nerve agents.

Can nerve agents spread from one person to another?

People who only breathe a small amount of the vapor and move quickly out of the area are not likely to have nerve agent on their clothes or skin. Nerve agents can spread from one person to another through clothing or skin that has been contaminated with large amounts of vapor or any amount of liquid. Since nerve agents are so toxic, the safest step is to remove the outer layer of clothing from anyone that may have been in a vapor. Avoid touching a contaminated person's skin or clothing.

Contaminated clothing and other belongings should be placed somewhere away from other people (ideally in a plastic bag if available). Other belongings that need to be bagged along with clothing include watches, jewelry, hair accessories, wallets, keys, purses and briefcases. Remove contact lenses and do not put them back in. Glasses can be put back on after washing them.

How is nerve agent poisoning diagnosed and treated?

Although blood tests for nerve agent exposures exist, doctors would use patient symptoms to recognize and treat nerve agent poisoning.

Most people with mild poisoning will get better after leaving the contaminated area, but it may take hours. An antidote (medicine) exists that must be given to seriously ill people as soon as possible. People with mild sickness may not need treatment with the antidote. Persons experiencing serious illness from nerve agents may need to be hospitalized.

Can exposure to nerve agents cause long-term problems?

Most people who recover from a nerve agent exposure do not have long-term physical problems. Some victims of the Tokyo subway attack reported long-term mental and emotional problems.

Where can more information about nerve agent poisoning be found?

If you need immediate medical attention, call 911 or go to a local emergency department. For a suspected poisoning, contact the regional poison center (1-800-222-1222). More information about the health effects of chemical poisonings can be found through the Virginia Department of Health at www.vdh.virginia.gov/EPR/Agents.asp or through the U.S. Centers for Disease Control and Prevention at www.bt.cdc.gov or www.atsdr.cdc.gov.